Canada: Alberta Power Grid Upgrade

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July 09

Summary

The Alberta Electric System Operator (AESO) is a non-profit entity, independent of industry affiliations, that plans and operates the Alberta Interconnected Electric System, also facilitating Alberta's wholesale electricity market.

The AESO has updated its Long-term Transmission System Plan (the Plan) to address electricity needs via transmission infrastructure projects between 2010 and 2017. AESO President and CEO David Erickson has identified rapid growth in recent years and the lack of "backbone transmission projects" for more than 20 years as the primary reasons for the power grid upgrade.

To elaborate on Erickson's assessment, the key factors influencing the Plan are:

- Increasing forecast load growth, averaging three per cent annually over the long term.
- The large generation construction (11,500 megawatts (MW)) is required over the next 20 years to keep up with load growth and to replace retiring generation units.
- The need to plan and build transmission in advance of generation and intertie developments.
- Increasing demand to integrate renewable and low-emission sources of electricity such as wind, hydro, biomass and gasification.
- Increasing the efficiency with which electricity is transmitted and consumed.
- Enabling a robust, competitive market for electricity.
- Minimizing land-use impacts of transmission.
- Enabling economic development.
- Near-term opportunities for lower costs of materials and increased labor availability.

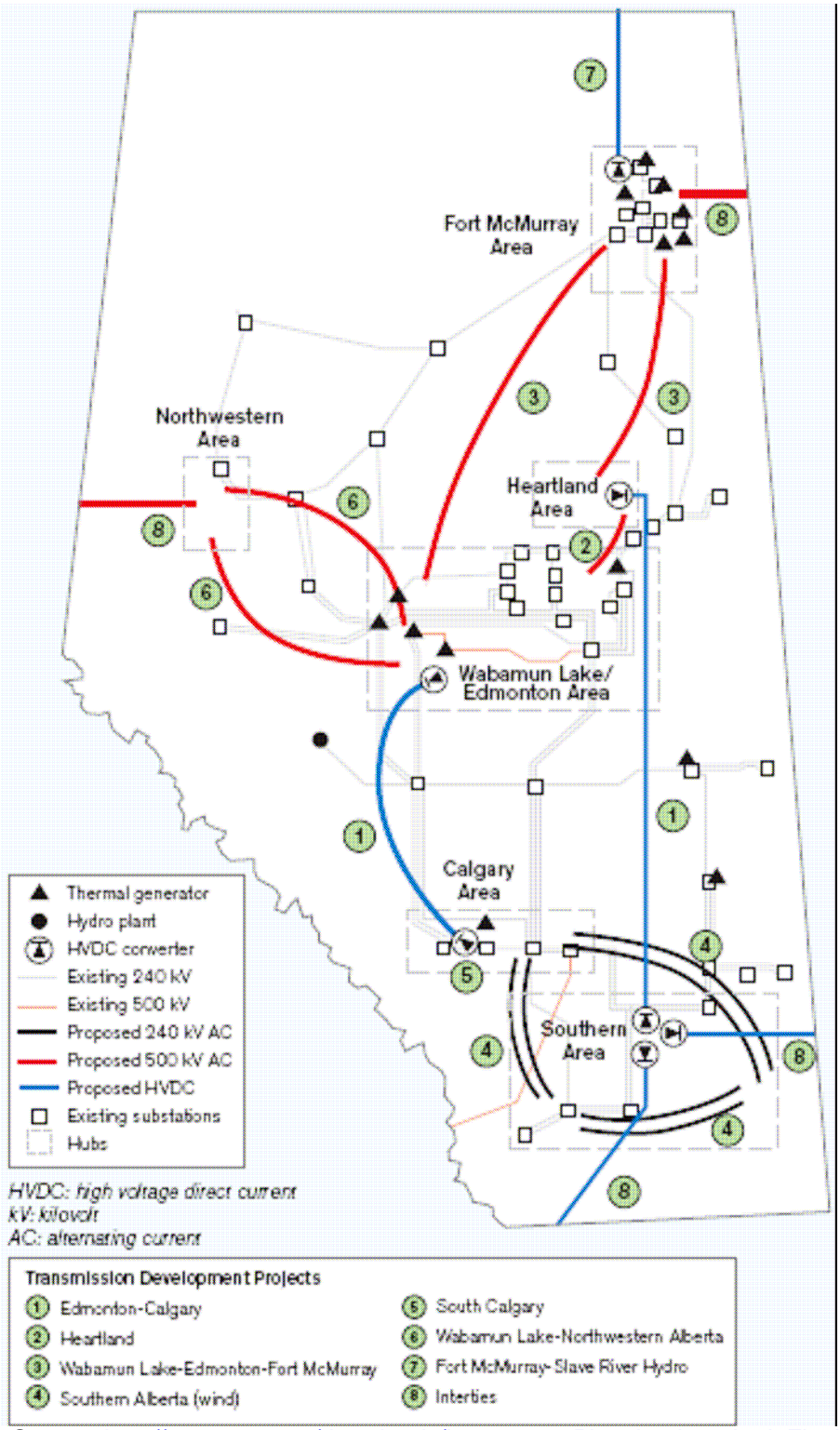
Market Demand

The need to upgrade the power grid is rooted in current inefficiencies and over-reliance on decades old electricity generation systems. As a result of inefficiencies in Alberta's transmission system, $196 million worth of electricity was lost in the form of heat from transmission lines in 2008. Going forward, the new transmission developments will be aimed at unlocking geographic constraints for all forms of electricity generation including "green energy" such as wind, solar, and hydroelectric power.

Five critical transmission infrastructure projects are highlighted in the Plan and have been classified by the AESO as "CTI-Tier 1," encompassing two 500 kV HVDC high-capacity lines from Edmonton to Calgary and Southern Alberta, one 500 kV double circuit AC line from the Edmonton area to the Industrial Heartland area (parts of Sturgeon, Strathcona and Lamont counties), two 500 kV lines to Fort McMurray, reinforcements to strengthen the transmission system in south Calgary, and new wind energy development in southern Alberta, which is currently in the regulatory process.

The CTI-Tier 1 projects carry estimated costs of $7.2 billion. The Plan also includes additional critical transmission infrastructure (CTI-Tier 2) projects, with a current estimated cost of $5.7 billion that are at a less advanced stage of planning. These include upgrades and regional projects. An overview of planned projects is given in the image on the following page.

Potential projects that will improve Alberta's interconnections with neighboring provinces and states are also identified within the scope of the Plan. These projects enable imports of power when required and exports of electricity surpluses.



Source: http://www.aeso.ca/downloads/Long-term_Plan_bookmarked_Final.pdf

Market Data

The table below provides an outlook for the CTI-Tier 1 projects.

Table 1: Major transmission reinforcements cost and schedule

Project	2008 $ millions	Construction schedule
Edmonton to Calgary reinforcements	3,135	2010 to 2013
Heartland transmission system reinforcements	387	2010 to 2015
Fort McMurray transmission system reinforcements	2,045	2010 to 2016
Southern Alberta (wind) transmission system reinforcements	2,454	2010 to 2017
South Calgary transmission reinforcements	100	2011 to 2012
Total	**8,121**	

Note: Figures in C$
Source: http://www.aeso.ca/downloads/Long-term_Plan_bookmarked_Final.pdf

Major Players in the Market:

Company Name	Central Business	Headquarters	Notes
ATCO Electric	Regulated distribution and transmission projects	Edmonton, AB	- 1400+ employees - 69000 km of transmission and distribution lines - Subsidiaries in Northern Canada (Yukon and NWT)
AltaLink	Transmission	Calgary, AB	- 350+ employees - 11800 km of transmission and distribution lines - Own a portion of the interconnection with British Columbia used to import and export electricity
EPCOR Distribution and Transmission Inc.	Substations and transmission lines	Edmonton, AB	- 203 km of transmission lines - Distributes 14% of Alberta's energy consumption
ENMAX Energy Corporation	Energy distribution supply and service	Calgary, AB	- 1742 employees - 7500 km of transmission and distribution lines - Wholly owned subsidiary of the City of Calgary

Market Entry

Prospective market entrants must contact transmission facility owners directly regarding specific projects. The use of third parties is a common practice, though it is necessary to first meet the criteria of each facility owner's approved vendor list. According to provincial legislation, each transmission facility owner must obtain at least 3 competitive bids for materials and labor.

ATCO Electric: http://www.atcoelectric.com/Our_services/Our_system/Trans_projects/Tproj.asp
AltaLink: http://albertaelectricityfuture.com/alberta/
http://www.altalink.ca/Default.aspx?DN=bdfd51d2-50ca-4383-883b-346a39a99bb5
EPCOR Distribution and Transmission: http://www.epcor.ca/en-ca/about-epcor/operations/Pages/default.aspx
ENMAX Energy Corporation: http://www.enmax.com/Power/Our+Services/default.htm

For SMEs looking to enter the market as sub contractors or sub suppliers, opportunities may exist in a large range of materials, equipment, and components for the electrical lines and stations (switchgear, transformers, connectors, isolators, etc.). The U.S. Commercial Service can provide services to contact general contractors.

Resources & Contacts

Alberta Electric System Operator. 2009, June 2. "Long-term Transmission System Plan identifies need for critical transmission system investments." http://www.aeso.ca/downloads/(June_2)_Long-term_Transmission_System_Plan_identifies_need_for_critical_transmission_system_investments.pdf

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For More Information

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